

=> d his

(FILE 'HOME' ENTERED AT 11:48:50 ON 03 FEB 2004)

FILE 'CA' ENTERED AT 11:48:59 ON 03 FEB 2004

L1 10369 S (MICROWAVE OR MICRO WAVE OR RF OR RADIO FREQUENCY OR R FREQUENCY) (6A) (SPECTROSC? OR SPECTROM? OR ANALYZER OR DETECTOR OR MONITOR OR SENSOR)

L2 183 S L1 AND ANISOTROP?

L3 136 S L1 AND COHERENT

L4 224 S L1(L) (BLOOD OR BODY OR BONE OR ORGAN OR TISSUE OR FINGER OR SAMPLE(3A)BIOLOG?)

L5 451 S L2-4 NOT PY>2000

L6 4 S L2-4 NOT L5 AND PATENT/DT AND PY<2001

L7 12 S L5 AND(BROADBAND OR MULTIWAVELENGTH OR MULTIFREQUENCY OR(MULTI OR MULTIPLE OR PLURAL) (2A) (FREQUENCY OR WAVELENGTH OR RADIATION))

L8 0 S L4 AND L2-3

L9 182 S L4 AND L5

L10 97 S L9 NOT ATOMIC(1A) (EMISSION OR ABSORPTION) (1A)SPECTRO?

L11 80 S L10 NOT(FLUORESCENCE OR MICROWAVE(2A) (DIGEST? OR DISSOL?))

L12 269 S L5 NOT L9

L13 27 S L12 AND TRANSIENT

FILE 'BIOSIS' ENTERED AT 12:22:42 ON 03 FEB 2004

L14 68 S L5

FILE 'MEDLINE' ENTERED AT 12:23:31 ON 03 FEB 2004

L15 49 S L5

FILE 'CA, BIOSIS, MEDLINE' ENTERED AT 12:24:29 ON 03 FEB 2004

L16 198 DUP REM L6 L7 L11 L13 L14 L15 (42 DUPLICATES REMOVED)

=> d bib,ab 116 1-198

L16 ANSWER 15 OF 198 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN

AN 2000:99217 BIOSIS

TI Microwave spectroscopy of myocardial ischemia and infarction. 1. Experimental study.

AU Semenov, Serguei Y. [Reprint author]; Svenson, Robert H.; Tatsis, George P.

CS Laser and Applied Technologies Laboratory, Carolinas Medical Center, 1000 Blythe Boulevard, Charlotte, NC, 28203-2861, USA

SO Annals of Biomedical Engineering, (Jan., 2000) Vol. 28, No. 1, pp. 48-54.

AB The purpose of this study was to assess whether physiologic changes in canine myocardium due to coronary **blood** flow reduction, ischemia, and infarction could be detected by changes in dielectrical properties. Measurements were made in the frequency range of 0.2-6.0 GHz. Percent coronary **blood** flow reduction was linearly related to the decrease in epsilon" at frequencies of 0.2 GHz(R= -0.997) and 1.1 GHz(R = -0.9987). In 2 h occlusions, increased conduction time in the infarct area mirrored the temporal changes in dielectrical properties. In 2-week-old infarctions differences, in epsilon' between normal and central infarct zones were statistically significant (P<0.05) for all frequencies. For epsilon" the differences between normal and central infarct zones were also significant for all frequencies (P<0.01). In conclusion, coronary **blood** flow reduction, ischemia, and infarction can be detected by **microwave spectroscopy** and potentially can form the basis for a physiologic microwave tomographic imaging system.

L16 ANSWER 27 OF 198 CA COPYRIGHT 2004 ACS on STN

AN 132:129725 CA

TI Spectroscopy with electronic terahertz techniques

AU Van Der Weide, Daniel W.; Murakowski, J.; Keilmann, Fritz

CS Dep. Electr. and Computer Eng., Univ. of Delaware, Newark, DE, USA

SO Proceedings of SPIE-The International Society for Optical Engineering (1999), 3828(Terahertz Spectroscopy and Applications II), 276-284

AB The authors report gas absorption spectra and energetic material reflection spectra measured with an all-electronic terahertz (THz) spectrometer. This instrument uses phase-locked microwave sources to drive picosecond GaAs nonlinear transmission lines, enabling measurement of both **broadband** spectra and single lines with hertz-level precision, a new mode of operation not readily available with optoelectronic THz techniques. The authors

take 2 approaches to **coherent** measurements: (1) spatially combining the freely propagating beams from 2 **coherent** picosecond pulse generators, or (2) using a more conventional **coherent** source/detector arrangement with sampling detectors. The 1st method employs a dual-source interferometer modulating each harmonic of 1 source with a precisely-offset harmonic from the other source - both sources being driven with stable phase-locked synthesizers - the resultant beat frequency can be low enough for detection by a std. composite bolometer. Room-temp. detection possibilities for the DSI include antenna-coupled Schottky diodes. Finally, the authors have recently introduced a reflectometer based on serrodyne modulation of a linearized delay line, using a technique that is process-compatible with pulse generator circuits.

L16 ANSWER 29 OF 198 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN

AN 1998:100927 BIOSIS

TI Speech articulator measurements using low power EM-wave sensors.

AU Holzrichter, J. F. [Reprint author]; Burnett, G. C.; Ng, L. C.; Lea, W. A.

CS Lawrence Livermore National Lab., P.O. Box 808, Livermore, CA 94551, USA

SO Journal of the Acoustical Society of America, (Jan., 1998) Vol. 103, No. 1, pp. 622-625.

AB Very low power electromagnetic (EM) wave sensors are being used to measure speech articulator motions as speech is produced. Glottal **tissue** oscillations, jaw, tongue, soft palate, and other **organs** have been measured. Previously, **microwave** imaging (e.g., using radar **sensors**) appears not to have been considered for such monitoring. Glottal **tissue** movements detected by radar sensors correlate well with those obtained by established laboratory techniques, and have been used to estimate a voiced excitation function for speech processing applications. The noninvasive access, coupled with the small size, low power, and high resolution of these new sensors, permit promising research and development applications in speech production, communication disorders, speech recognition and related topics.

L16 ANSWER 30 OF 198 CA COPYRIGHT 2004 ACS on STN

AN 129:133378 CA

TI Radio frequency spectral analysis for in-vitro or in-vivo environments

IN Fuller, Milton E.; Deamer, David W.; Iverson, Mark N.; Koshy, Ajit J.

PA Solid State Farms, Inc., USA

SO U.S., 27 pp., Cont.-in-part of U. S. 5,508,203.

PI US 5792668 A 19980811 US 1996-631916 19960415 <--

US 5508203 A 19960416 US 1993-103410 19930806 <--

PRAI US 1993-103410 A2 19930806

AB Conc. of a target chem. in the presence of other substances in a specimen is detd. by subjecting the specimen to radio frequency electromagnetic components, sequentially or otherwise, ranging to ~5 GHz. The reflected and/or transmitted signal real and imaginary components at the specimen are spectrally examd. as a function of frequency to identify the presence and/or concn. of the chem. of interest. Such examn. includes anal. of the effective complex impedance presented by the specimen, and/or effective phase shift between the transmitted and reflected signal at the specimen. The effects upon glucose concn. measurements of varying electrolytes, primarily NaCl, can be nulled-out by examg. impedance magnitude at a cross-over frequency, for example ~2.5 GHz. NaCl concn. exhibits a very linear relation with phase shift change at frequencies in the 2 GHz-3 GHz range. In a specimen that is blood, such phase shift measurements provide data proportional to NaCl concn. Impedance magnitude measurements using 1 MHz to 400 MHz frequencies provides a measure of combined concn. of glucose and NaCl. The phase shift data may then be used to substrate out the NaCl concn. from the combined concn., to yield a good measure of glucose concn. Such tests may be conducted in-vitro or in-vivo and lend themselves to blood level glucose analyses by diabetics.

L16 ANSWER 32 OF 198 CA COPYRIGHT 2004 ACS on STN

AN 129:14076 CA

TI A **broadband** pulsed radio frequency electron paramagnetic resonance spectrometer for biological applications

AU Murugesan, Ramachandran; Afeworki, Mobae; Cook, John A.; Devasahayam, Nallathamby; Tschudin, Rolf; Mitchell, James B.; Subramanian, Sankaran; Krishna, Murali C.

CS Division of Clinical Sciences, Radiation Biology Branch, National Cancer Institute, NIH, Bethesda, MD, 20892, USA

SO Review of Scientific Instruments (1998), 69(4), 1869-1876

AB A time-domain **radio frequency (rf)** ESR (EPR) **spectrometer/imager (EPRI)** capable of detecting and imaging free radicals in biol. objects is described. The magnetic field was 10 mT which corresponds to a resonance frequency of 300 MHz for paramagnetic species. Short pulses of 20-70 ns from the signal generator, with rise times of less than 4 ns, were generated using high speed gates, which after amplification to 283 Vpp, were deposited into a resonator contg. the object of interest. Cylindrical resonators contg. parallel loops at uniform spacing were used for imaging expts. The resonators were maintained at the resonant frequency by tuning and matching capacitors. A parallel resistor and overcoupled circuit was used to achieve Q values in the range 20-30. The transmit and receive arms were isolated using a transmit/receive diplexer. The dead time following the trailing edge of the pulse was about 450 ns. The first stage of the receive arm contained a low noise, high gain and fast recovery amplifier, suitable for detection of spin probes with spin-spin relaxation times (T2) in the order of μ s. Detection of the induction signal was carried out by mixing the signals in the receiver arm centered around 300 MHz with a local oscillator at a frequency of 350 MHz. The amplified signals were digitized and summed using a 1 GHz digitizer/summer to recover the signals and enhance the signal-to-noise ratio (SNR). The time-domain signals were transformed into frequency-domain spectra, using Fourier transformation (FT). With the resonators used, objects of size up to 5 cm³ could be studied in imaging expts. Spatial encoding of the spins was accomplished by vol. excitation of the sample in the presence of static field gradients in the range of 1.0-1.5 G/cm. The spin densities were produced in the form of plane integrals and images were reconstructed using std. back-projection methods. The image resoln. of the phantom objects contg. the spin probe surrounded by lossy biol. medium was better than 0.2 mm with the gradients used. To examine larger objects at local sites, surface coils were used to detect and image spin probes successfully. The results from this study indicate the potential of rf FT EPR for in vivo applications. In particular, rf FT EPR may provide a means to obtain physiol. information such as **tissue** oxygenation and redox status.

L16 ANSWER 39 OF 198 CA COPYRIGHT 2004 ACS on STN

AN 126:128980 CA

TI Apparatus for spectroscopic investigation of samples from the human body

IN Scharff, Wolfram; Petrich, Ralf; Wallendorf, Till; Schmidt, Guenther; Delan, Axel

PA IFU GmbH Privates Institut fuer Umweltanalysen, Germany

SO Ger. Offen., 4 pp.

PI DE 19522774 A1 19970102 DE 1995-19522774 19950627

PRAI DE 1995-19522774 19950627

AB Instrumentation for disease diagnosis and therapeutic monitoring is provided, which, by means of spectroscopic examn. of samples obtained from the human **body** (e.g., **blood**, urine, breath), can give clues to existing disease conditions and, e.g., provide early diagnosis of cancer. The set-up consists of at least a spectroscopic sample-analyzing unit that is connected to an intelligent self-learning unit with a neural network by means of a control and data-processing block which is, in turn, connected to a data storage unit. The measuring unit can consist of an acoustooptical spectrometer and/or a gas analyzer. The gas analyzer, which can be used to identify gaseous metabolic products, contains a mass spectrometer and/or a gas chromatograph and/or an odor **sensor** and/or a **microwave spectrometer**. The data storage can be done with, e.g., a CD-ROM. The system makes it possible to obtain completely new spectra or to compare obtained spectra with earlier obtained spectra by using the intelligent expert system based on a neural network. Also, the system makes possible the simultaneous anal. of >1 sample by different spectroscopic methods.

L16 ANSWER 50 OF 198 CA COPYRIGHT 2004 ACS on STN

AN 125:109210 CA

TI Modification of a whole-body NMR imager into a **radio frequency EPR spectrometer** suitable for in vivo measurements

AU McCallum, S. J.; Alecci, M.; Luri, D. J.

CS Dep. Bio-Medical Physics/Bio-Eng., Univ. Aberdeen, Aberdeen, AB9 2ZD, UK

SO Measurement Science & Technology (1996), 7(7), 1012-1018

AB We report the modification of a low-field whole-body NMR imager to allow **radio frequency EPR spectroscopy**. The instrument is designed to give optimum sensitivity for in vivo detection of free radicals. The RF circuit is able to operate over a wide frequency range (240-320 MHz) and is designed to handle input power levels of up to 12.5 W. The EPR resonator is of the loop-gap type suitable for samples up to 400 mL. A remote resonator coupling method has been developed enabling convenient matching adjustment. An automatic frequency control circuit is able to adjust for frequency deviations caused by animal motion. Where possible, existing imager hardware and com. available instruments have been used. The instrument is controlled from a central computer via an IEEE 48 instrumentation bus. Here we present sensitivity measurements obtained from a variety of large aq. samples contg. nitroxide free radicals. We show that the instrument is suitable for the detection of exogenous free radicals in 200 g rats.

L16 ANSWER 54 OF 198 CA COPYRIGHT 2004 ACS on STN

AN 125:56528 CA

TI Development of a microwave moisture sensor for application in the food industry

AU Hinz, T.; Menke, F.; Eggers, R.; Knoechel, R.

CS Arbeitsbereich Verfahrenstechnik II, Technische Univ. Hamburg-Harburg, Hamburg, 21071, Germany

SO Food Science & Technology (London) (1996), 29(4), 316-325

AB The basic development of a contactless optionally d.-independent and continuously operating online **microwave** moisture **sensor** for org. bulk materials is presented. Moisture detn. by means of microwave power is volumetric, but for the process control, quality preservation etc., the water content in wt. percentage is recommended. Therefore, d. and structure parameters, as well as dielec. properties, of different org. bulk materials with characteristic particle shape are measured and compared under different moisture content. Due to cellular **tissues** and org. compds., structural behavior depends very much on moisture and temp. Results from compression expts. show the possibility of keeping the bulk structure const. within a wide range of water content. Consequently, microwave moisture measurement could be d.-independent. A first calcn. model shows the correlation between structure properties and the dielec. const.

L16 ANSWER 74 OF 198 CA COPYRIGHT 2004 ACS on STN

AN 121:310700 CA

TI Photonic bound states in two-dimensional photonic crystals probed by **coherent-microwave transient spectroscopy**

AU Lin, S. Y.; Arjavalingam, G.

CS IBM Res. Div., Thomas J. Watson Res. Cent., Yorktown Heights, NY, 10598, USA

SO Journal of the Optical Society of America B: Optical Physics (1994), 11(10), 2124-7

AB The photonic analog of a semiconductor quantum well (QW) is constructed for the 1st time to the knowledge from two-dimensional periodic dielec. arrays. A sharp transmission peak is obsd. in the photonic bandgap spectral region of the barrier and is attributed to resonant transmission of an electromagnetic wave through a photonic bound state in this structure. In contrast with bound-state energy levels in semiconductor QW's, the photonic bound state shifts to a higher frequency as the well width is increased, and a 2nd bound state appears on the lower-frequency side.

L16 ANSWER 86 OF 198 MEDLINE on STN

AN 94365734 MEDLINE

TI Permittivities of fresh fruits and vegetables at 0.2 to 20 GHz.

AU Nelson S; Forbus W Jr; Lawrence K

SO JOURNAL OF MICROWAVE POWER AND ELECTROMAGNETIC ENERGY, (1994) 29 (2) 81-93.

AB Permittivities, moisture contents, **tissue** densities, and total soluble solids data were determined for samples of twenty-three kinds of fresh fruits and vegetables at 23 degrees C. Permittivities were measured at 41 frequencies between 200 MHz and 20 GHz with an open-ended coaxial-line probe and a **microwave** network **analyzer**. Results of the permittivity measurements are presented graphically, and dielectric constant and loss factor values at six frequencies across the range are tabulated along with sample descriptions and moisture, density, and total soluble solids data. Although specific values differ, the dielectric constant decreases steadily with increasing frequency, dropping more rapidly at frequencies above 5 GHz. Values for the loss factor decrease as frequency increases above 200 MHz to a

broad minimum in the 1- to 3-GHz region and then increase again as the frequency approaches 20 GHz. The dielectric behavior of the fruit and vegetable **tissues** appears to be influenced by ionic conductivity and bound water relaxations at the lower frequencies and by free water relaxation at the higher end of the frequency range.

L16 ANSWER 87 OF 198 CA COPYRIGHT 2004 ACS on STN

AN 122:125427 CA

TI In vivo EPR spectroscopy of free radicals in the heart

AU Zweier, Jay L.; Kuppusamy, Periannan

CS EPR Laboratories, Johns Hopkins Medical Institutions, Baltimore, MD, 21224, USA

SO Environmental Health Perspectives Supplements (1994), 102(Suppl. 10), 45-51

AB ESR spectroscopy can be applied to directly measure free radicals; however, it has not been possible to measure important biol. radicals in situ because conventional spectrometer designs are not suitable for the performance of measurements on large aq. structures such as whole **organs** or **tissues**. The authors describe the design, construction, and application of instrumentation developed in an effort to obtain optimum performance in measuring free radicals in intact biol. **organs** or **tissues**. This **spectrometer** consists of a 1-2-GHz **microwave** bridge with the source locked to the resonant frequency of a specially designed recessed gap, loop-gap resonator. The principles of resonator design and construction are analyzed and described. Using this spectrometer radical concns. as low as 0.4 μM in aq. solns. could be measured. Studies of isolated beating hearts involving simultaneous real time measurements of free radicals and cardiac contractile function are performed. This in vivo EPR technique is applied to study the kinetics of free radical uptake and metab. in normally perfused and globally ischemic hearts. In addn., it is demonstrated that this technique can be used to noninvasively measure **tissue** oxygen consumption. Thus, low frequency EPR spectroscopy offers great promise in the study of in vivo free radical generation and the effects of this radical generation on whole biol. **tissues**.

L16 ANSWER 92 OF 198 CA COPYRIGHT 2004 ACS on STN

AN 119:37194 CA

TI A **broadband microwave** Fourier transform **spectrometer**, especially designed for Stark effect investigations of almost nonpolar molecules; the electric dipole moment and the **anisotropy** in the static electric polarizability tensor of 1,1-dideuteroallene, $\text{D}_2\text{C} = \text{C} = \text{CH}_2$

AU Meyer, V.; Sutter, D. H.

CS Abt. Chem. Phys., Christian-Albrechts-Univ., Kiel, W-2300/1, Germany

SO Zeitschrift fuer Naturforschung, A: Physical Sciences (1993), 48(5-6), 725-32

AB A bridge type **microwave** Fourier transform **spectrometer**, equipped with flat oversized Stark cells and an operational range from 8 GHz to 40 GHz is described. As application we report the exptl. detn. of the vibronic ground state dipole moment and of the **anisotropy** in the static polarizability of 1,1-dideuteroallene. Our exptl. values are: $\mu_a = 0.0053(2)$ D for the dipole moment, and $(\alpha_{\text{dblvert.}} - \alpha_{\perp}) = 4.26(6) \cdot 10^{-24} \text{ cm}^3$, for the polarizability **anisotropy**.

L16 ANSWER 93 OF 198 CA COPYRIGHT 2004 ACS on STN

AN 118:179127 CA

TI Low-temperature dependence of the foreign gas relaxation of cyanoacetylene with microwave **coherent transients** induced by frequency switching

AU Rohart, Francois

CS Lab. Spectrosc. Hertzienne, Univ. Lille I., Villeneuve d'Ascq, 59655, Fr.

SO Journal of Molecular Spectroscopy (1993), 158(2), 287-97

AB The temp. dependence of the rotational foreign gas relaxation of cyanoacetylene HC_3N is investigated in the 150-300 K range on static gas samples. The expt. exploits the great sensitivity of the **coherent transient** technique, and a frequency-switched spectrometer was developed at a 3-mm wavelength: the frequency control setup is described and analyzed from the point of view of **coherent transient** phenomena. For the $J = 11 \leftarrow 10$ line of HC_3N , exptl. results on the relaxation induced by N_2 , H_2 , and He vs the temp., and by O_2 and Ar at room temp., are reported. Using the Anderson-Tsao-Curnutte formalism, the N_2 -induced relaxation of HC_3N is theor. predicted for other rotational lines of interest for planetary atm. studies.

L16 ANSWER 114 OF 198 CA COPYRIGHT 2004 ACS on STN

AN 115:195804 CA

TI **Broadband** microwave dielectric properties of lithium niobate

AU Robertson, W. M.; Arjavalingam, G.; Kopcsay, G. V.

CS T. J. Watson Res. Cent., IBM Res. Div., Yorktown Heights, NY, 10598, USA

SO Electronics Letters (1991), 27(2), 175-6

AB The **anisotropic** microwave refractive index and loss of lithium niobate, in the 15-140 GHz range, are measured using the **coherent microwave transient spectroscopy** technique. The frequency-dependent complex transmission function of a 5.98 mm thick crystal is studied as a function of the angle between the elec. field and the optic axis.

L16 ANSWER 116 OF 198 CA COPYRIGHT 2004 ACS on STN

AN 116:195364 CA

TI **Broadband** microwave dielectric properties of polymers

AU Robertson, W. M.; Pastol, Y.; Arjavalingam, G.; Halbout, J. M.; Kopcsay, G. V.

CS Thomas J. Watson Res. Cent., IBM, Yorktown Heights, NY, 10598, USA

SO Materials Research Society Symposium Proceedings (1991), 214(Opt. Electr. Prop. Polym.), 87-93

AB **Coherent microwave transient spectroscopy** can be used to det. the complex dielec. properties of materials over a broad frequency range; the technique is based on radiation and detection of picosecond-duration electromagnetic transients by optoelectronically pulsed antennas. The technique is illustrated for a polyimide and a polyamide and doped polyacetylene.

L16 ANSWER 117 OF 198 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN

AN 1991:205916 BIOSIS

TI MICROWAVE RADIOMETRY IN THE DETECTION OF ESOPHAGEAL CANCER.

AU LI E-Z [Reprint author]; ET AL

CS HUBEI TUMOR HOSP, WUCHANG

SO Zhongguo Zhongliu Linchuang, (1991) Vol. 18, No. 1, pp. 29-31.

LA CHINESE

AB A flow diagram of microwave radiation in layered human **tissues** was obtained basing on the principles of bioelectromagnetics and biomedical engineering. Some important problems related to the detection of esophageal cancer by Model 846 **microwave cancer detector** were also studied. As a result an appropriate method and a set of diagnostic criteria which would be processed by microcomputer were obtained. Of 67 cases examined by Model 846 detector, 17 of 21 cases of esophageal cancer were positive, a true positive rate of 81%, while 36 of 46 control cases were negative, a true negative rate of 78.3%. The results indicate that this method might be of great value in the screening and early diagnosis of esophageal cancer.

L16 ANSWER 122 OF 198 CA COPYRIGHT 2004 ACS on STN

AN 113:87306 CA

TI Effects of substrate **anisotropy** on the dispersion of **transient** signals in microstrip lines

AU Zheng, G. W.; Chen, K. S.

CS Inf. Sci. Electron. Eng. Dep., Zhejiang Univ., Hangzhou, 310008, Peop. Rep. China

SO International Journal of Infrared and Millimeter Waves (1990), 11(4), 489-98

AB The anal. of dispersion characteristics of **transient** signal in microstrip lines with **anisotropic** substrate is developed, with particular attention directed toward the effects of arbitrary orientations of the principal optical axis in **anisotropic** substrates. Numerical simulations are carried out for the propagation of **transient** signals, square or Gaussian pulses, along microstrips with **anisotropic** substrates. The dispersion characteristics is substantially affected by the change of the orientation angle of the principal optical axis in the substrate.

L16 ANSWER 125 OF 198 CA COPYRIGHT 2004 ACS on STN

AN 113:107093 CA

TI **Anisotropic** conductivity in stretch-oriented polymers measured with **coherent microwave transient spectroscopy**

AU Arjavalingam, G.; Theophilou, N.; Pastol, Y.; Kopcsay, G. V.; Angelopoulos, M.

CS T. J. Watson Res. Cent., IBM Res. Div., Yorktown Heights, NY, 10598, USA
SO Journal of Chemical Physics (1990), 93(1), 6-9
AB Stretch-oriented and doped polyacetylene and polyaniline are characterized using the **coherent microwave transient spectroscopy** technique. Conductivities parallel and perpendicular to the direction of elongation are detd. The measured orientation dependence of the sample transmissions is obsd. to follow the predictions of theory.

L16 ANSWER 131 OF 198 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN
AN 1989:183737 BIOSIS
TI THE X-RAY MICROANALYSIS METHOD FOR INVESTIGATION OF CHEMICAL COMPOSITION OF NORMAL AND PATHOLOGIC HUMAN PERIPHERAL BLOOD LYMPHOCYTES.
AU PILCH J [Reprint author]; LASKAWIEC J; LISIEWICZ J
CS CLIN OF LARYNGOL, SILESIAN MED UNIV ACADEMY, FRANCUSKA ST 20/24, KATOWICE 40-027
SO Folia Haematologica (Leipzig), (1988) Vol. 115, No. 5, pp. 727-736.
AB The X-ray microanalysis method for investigation of chemical composition, mainly trace elements, of normal and pathologic human peripheral **blood** lymphocytes has been presented. The method in question consists of two stages. During the first stage the scanning electron microscope with the energy dispersive X-ray spectrometer has been used. The second stage of the method consisted of employing the above microscope with the **microwave** dispersive **spectrometer**. The method enables the short-term determination of the various elements content within the lymphocytes with particular insight into the content of elements in a single cell. The preliminary investigations showed significant differences in the content of chlorine, sulfur and lead in normal human lymphocytes and that from patients with cancer of the larynx.

L16 ANSWER 137 OF 198 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN
AN 1987:206841 BIOSIS
TI MICROWAVE THERMOGRAPHY AN INDEX OF INFLAMMATORY JOINT DISEASE.
AU FRASER S [Reprint author]; LAND D; STURROCK R D
CS CENT FOR RHEUMATIC DISEASES, UNIV DEP OF MED, ROYAL INFIRMARY, GLASGOW G4 0EH, UK
SO British Journal of Rheumatology, (1987) Vol. 26, No. 1, pp. 37-39.
AB Microwave thermography is a technique measuring microwave emission from sites of inflammation. Microwaves have a wavelength of around 10 cm are therefore able to penetrate clinically useful depths of up to 4 cm directly measuring **tissue** thermal radiation. A **microwave detector** was applied to the study of joint inflammation in rheumatoid arthritis and in a normal control group. Fifty-two knees were scanned using the **detector** and a **microwave** thermographic index was calculated for each knee. A strong correlation was found between the microwave thermographic index, and the clinical and laboratory parameters measured. This technique was found to be reproducible, quick, simple to use at the bedside without a controlled environment and, since it measures internally emitted radiation, is inherently safe.

L16 ANSWER 152 OF 198 CA COPYRIGHT 2004 ACS on STN
AN 99:118624 CA
TI Determination of urea in **blood** serum with use of immobilized urease and a **microwave** cavity ammonia **monitor**
AU Hirose, Sachio; Hayashi, Mitsuhiro; Tamura, Noriyoshi; Kamidate, Tamio; Karube, Isao; Suzuki, Shuichi
CS Cent. Res. Lab., Mitsubishi Petrochem. Co. Ltd., Ibaraki, 300-03, Japan
SO Analytica Chimica Acta (1983), 151(2), 377-82
AB The system for urea detn. consists of urease immobilized on porous PVC coated on the inside of a test tube, and a dissolved NH3 monitor comprising a dialyzer and a Stark microwave cavity resonator. The total time required for the detn. of urea in serum is 18 min (the enzymic reaction requires 10 min) and the calibration graph for urea-N is linear in the range 10-750 mg/L. The relative std. deviation is 5%; there are very few interferences.

L16 ANSWER 169 OF 198 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN
AN 1980:235430 BIOSIS
TI ELECTRO MAGNETIC PROPERTIES OF BIOLOGICAL SOLUTIONS 1. GENERAL CONSIDERATIONS AND PRESENTATION OF AN IMPROVED SYSTEM FOR **MICROWAVE SPECTROSCOPY** OF SMALL **BIOLOGICAL SAMPLES**.
AU BIANCO B [Reprint author]; DRAGO G P; MARCHESI M; MARTINI C; MELA G S; RIDELLA S

CS ISMI, CATTEDRA CLIN MED R, UNIV GENOVA, GENOVA, ITALY

SO Bollettino Societa Italiana Biologia Sperimentale, (1979) Vol. 55, No. 22, pp. 2322-2328.

AB A method is presented to measure the complex dielectric constant of biological liquids in the frequency range 100-2000 MHz. With such measurements, it is possible to obtain useful information about microscopic properties of living matter, with possible diagnostic applications.

=> log y

STN INTERNATIONAL LOGOFF AT 12:26:05 ON 03 FEB 2004

=> d his

(FILE 'HOME' ENTERED AT 08:28:43 ON 03 FEB 2004)

FILE 'CA' ENTERED AT 08:28:52 ON 03 FEB 2004

E VEDRUCCIO C/AU

L1 1 S E4

L2 2709 S ELECTROMAGNETIC(3A) (ANALY? OR DETECT? OR MONITOR OR SENSOR)

L3 30 S L2 AND (ANISOTROPY OR ISOTROPY)

L4 46 S L2 AND COHERENT

L5 75 S L3-4

=> d bib,ab 1-75 l5

L5 ANSWER 18 OF 75 CA COPYRIGHT 2004 ACS on STN

AN 135:187380 CA

TI New design for increased terahertz power from LTG GaAs photomixers

AU Yeh, D. J.; Brown, Elliott R.

CS Department of Electrical Engineering, University of California, Los Angeles, Los Angeles, CA, 90095-1594, USA

SO Proceedings of SPIE-The International Society for Optical Engineering (2000), 4111(Terahertz and Gigahertz Electronics and Photonics II), 124-132

AB Photoconductive mixing in ultrafast photoconductors (LTG- GaAs) represents an optoelectronic means of generating **coherent** radiation at THz frequencies from optical pump laser. TO date the power from such photomixers was limited to microwatt levels by thermal burn-out. The authors analyze a new design in which the LTG-GaAs is fabricated both in a resonant planar dipole and in a vertical optical cavity. This is accomplished with an elec.-floating metal layer lying below the thin LTG-GaAs layer by ~0.5 μ . Optical anal. shows that the metal layer can increase the external quantum efficiency of the photomixer ~3 times through creation of a vertical optical cavity in the LTG-GaAs layer. Heat-transfer anal. shows that the metal layer reduces the photomixer thermal resistance ~2.5 times, allowing for an increase in the optical pump power by roughly the same factor. Finally, full-wave **electromagnetic anal.** shows that the metal layer has a small impact on the radiation pattern of the planar dipole above it, presumably because the layer is much smaller laterally than a wavelength and is elec. floating. In total, these beneficial effects are predicted to increase the output THz power by approx. a factor of 10 compared to any result reported to date.

L5 ANSWER 20 OF 75 CA COPYRIGHT 2004 ACS on STN

Full Text

AN 134:109891 CA

TI **Electromagnetic analyzer of anisotropy** in chemical organized systems

IN Vedruccio, Clarbruno

PA Italy

SO PCT Int. Appl., 14 pp.

PI WO 2001007909 A1 20010201 WO 2000-IT316 20000726

PRAI IT 1999-BO422 A 19990727

AB The present invention relates to an app. devoted to multiple use: preventive diagnostics in medical field, as the precocious diagnosis of anomalies of the woman breast, of the reproductive organs, and of many biol. human and animal tissues anomalies. In the industry this invention

could be used for anal. of agglomerations of materials like terrain, sand, concrete, tires, etc. and as detector, for security systems, of the crossing of areas what sheds, built, squares, open spaces, fluids also to low d. and gas also extremely rarefied, and in the void. It can be used also for detection of buried metallic, conductive or dielec. objects of different compn. from the analyzed terrain or generic area, operating on the specific compatible bands of frequency related to the matter to irradiate. Useful in archaeol., in techniques of geol. prospecting and many other fields like physics of the atm., weather forecast systems, **coherent** multi-frequency oscillator in synthetic aperture radar (SAR), telecommunication devices and aerospace technologies.

L5 ANSWER 24 OF 75 CA COPYRIGHT 2004 ACS on STN

AN 132:301690 CA

TI Electro-magnetic analysis of high Tc superconductors based on anisotropic E-J characteristics

AU Amemiya, N.; Miyamoto, K.; Mukai, H.; Sato, K.

CS Yokohama National University, Yokohama, 240, Japan

SO Advances in Cryogenic Engineering (1998), 44(Pt. B), 699-705

AB When high Tc superconductors are used in the elec. power apparatuses at com. frequency, they are often exposed to the spatially varied external magnetic field. It induces an addnl. circulating current in the superconductors, and increases the AC loss. Since this current has basically two components in the different directions, **anisotropy** of the superconducting property influences the current profile and the AC loss. A numerical code for the **electromagnetic anal.** of high Tc superconductors by finite element method has been developed. The anisotropic E-J characteristics of superconductor are taken into account. Magnetization of a small piece of a high Tc superconducting tape is measured to compare with the numerical results.

L5 ANSWER 25 OF 75 CA COPYRIGHT 2004 ACS on STN

AN 132:240023 CA

TI Nondestructive characterization of material properties of gray cast iron and forged components

AU Feiste, Karsten L.; Marques, Patricia Fetter; Reimche, Wilfried; Stegemann, Dieter

CS Institut fur Kerntechnik und Zerstorungsfreie Prufverfahren, Universitat Hannover, Germany

SO Werkstoffwoche '98, Band X: Symposium 13, Werkstoffpruefung, Munich, Sept., 1998 (1999), Meeting Date 1998, 385-390. Editor(s): Muster, Walter; Ziebs, Josef; Link, Rainer. Publisher: Wiley-VCH Verlag GmbH, Weinheim, Germany.

LA German

AB The harmonic anal. of eddy current signals was developed for nondestructive characterization of the material properties (**anisotropy**, hardness, tensile strength, and yield stress) gray cast iron and forged components. A description is given of the working principle of the above method together with the setup of a measuring system.

L5 ANSWER 26 OF 75 CA COPYRIGHT 2004 ACS on STN

AN 132:240022 CA

TI Harmonic measuring system for nondestructive determination of properties of sheet steel

AU Reimche, W.; Heutling, B.; Krys, A.; Stegemann, D.; Feiste, K.; Kroos, J.; Stolzenberg, M.; Westkamper, G.; Angerer, R.

CS Institut fur Kerntechnik und Zerstorungsfreie Prufverfahren, Universitat Hannover (D), Germany

SO Werkstoffwoche '98, Band X: Symposium 13, Werkstoffpruefung, Munich, Sept., 1998 (1999), Meeting Date 1998, 377-384. Editor(s): Muster, Walter; Ziebs, Josef; Link, Rainer. Publisher: Wiley-VCH Verlag GmbH, Weinheim, Germany.

LA German

AB The harmonic anal. of eddy current signals was developed for nondestructive characterization of the material properties (**anisotropy**, hardness, tensile strength, and yield stress) of C steel sheet for automobile bodies. A description is given of the working principle of the above method together with the setup of a measuring system. Examples are given of the detn. of the tensile strength of some steel grades.

L5 ANSWER 27 OF 75 CA COPYRIGHT 2004 ACS on STN

AN 132:129239 CA

TI **Coherent** terahertz spectroscopy

AU Bolivar, Peter Haring

CS RWTH, Aachen, Germany

SO Proceedings of the Scottish Universities Summer School in Physics (1999),
50th(Semiconductor Quantum Optoelectronics), 151-192

AB In a review with 57 refs. the authors discuss terahertz (THz) spectroscopy with emphasis on THz emission mechanisms. The author also compares two **detection** schemes of THz **electromagnetic** fields, photoconductive and electrooptic detection, and describes several applications of THz spectroscopy.

L5 ANSWER 31 OF 75 CA COPYRIGHT 2004 ACS on STN

AN 129:47154 CA

TI **Coherent** repopulation of components of a three-level quantum system in the field of a pulse bichromatic radiofrequency wave

AU Zaretskii, D. F.; Sazonov, S. B.

CS Ross. Nauchn. Tsentr "Kurchatov. Inst.", Moscow, 123182, Russia

SO Zhurnal Eksperimental'noi i Teoreticheskoi Fiziki (1998), 113(4), 1181-1192

LA Russian

AB A process of the **coherent** repopulation of the quantum system consisting of three non-equiv. levels in the field of the bichromatic radio-frequency wave is studied. Interactions of atoms with **electromagnetic** wave was **analyzed** formation for the pulsed conditions with the pulse lifetime shorter than the relaxation time. The hyperfine structure of the gas atoms and a system of oscillating equations for atoms in the magnetic trap was considered. The magnetic traps could be used for cooling of neutral atoms.

L5 ANSWER 34 OF 75 CA COPYRIGHT 2004 ACS on STN

AN 127:144176 CA

TI Broad-band measurement of all complex permeability tensor components and complex permittivity of ferrites using a rectangular waveguide

AU Queffelec, P.; Talbot, Ph.; Le Floc'h, M.; Gelin, Ph.

CS LEST-URA CNRS, Brest, 29285, Fr.

SO Journal de Physique IV (1997), 7(C1, 7th International Conference on Ferrites, 1996), C1/153-C1/154

AB The authors have worked out a broad-band characterization method for magnetized ferrimagnetic materials. The technique is based on the reflection/transmission measurement of the S-parameters of a rectangular waveguide partly loaded with a ferrite that is to be characterized. The device is set in between the poles of an electromagnet to magnetize the sample. The fundamental principle of the measurement consists in using the **anisotropy** of the material to lead to the nonreciprocity of the cell ($S_{11} \neq S_{22}$ and $S_{21} \neq S_{12}$) to have the same no. of information that for the characteristics the authors want to det. (complex permittivity and all complex permeability tensor components). The authors will compare in the X-band (8-12.4 Ghz) the theor. S-parameters of the cell with those measured by the network analyzer for different ferrites of known properties to validate the **electromagnetic anal.** of the cell. The authors will underscore the importance of the losses which are entirely responsible for the nonreciprocity of the S-parameters modulus. To conclude the authors will suggest a strategy to resolve the inverse problem with an optimization method.

L5 ANSWER 37 OF 75 CA COPYRIGHT 2004 ACS on STN

AN 126:48951 CA

TI Analytic and experimental study of electromagnetic waves interaction with hydrocarbon reservoirs

AU Gololobov, D. V.; Moskvichev, D. V.; Stadnik, Yu. N.

CS BGUIR, Belarus

SO Geologiya Nefti i Gaza (1995), (3), 26-30

LA Russian

AB Undoubted advantage of radiowave methods of fields distance sounding is clearly seen, comparing with traditional methods. These alternative direct methods are ecol. clearer and 25-30 times cheaper. Creating of the model, describing interaction of electromagnetic waves

with deep-seated hydrocarbons, is of great importance for prospecting and hydrocarbon pools outlining. The proposed model is based on rising of free charge bearers over hydrocarbon pool and their moving to the Earth surface, on formation of medium with space and frequency dispersion over fields. Rocks outside a pool counter happen to be neutral system, being in chem., phys. and thermo-dynamic equil. with the environment. Analytic and exptl. study of interaction between radio-wave fields and modeled rocks over hydrocarbon pool allowed to define structure and characteristics of sounding signal response during radio-wave influence at oil and gas field: 1. different conditions of left and right-polarized waves spreading in contg. rocks and cross-polarized splitting during slope falling of electromagnetic wave at underlying surface cause distortion of emitters directions diagram (enlarging of the main petal, displacing of max. emitting direction); 2. frequency correlation is obsd. between parameters of contg. rocks over a pool and amplitude anomalies of sounding signals are marked at a field border at the area of resonance frequencies; 3. noise background changing is possible over a pool, caused by transformation of vol. waves and collective phenomena into addnl. electromagnetic radiation, providing electromagnetic waves absorption; and 4. **anisotropy** of surface impedance of contg. rocks over hydrocarbon pool define contrast of enter resistance of ultra high frequency emitters. Thus, analytic substantiation and exptl. proving of the proposed model, describing interaction of electromagnetic waves with hydrocarbon pool, creating of measuring complex, working out of the method, for fields outlining and its testing at functioning oil and gas fields allow to include radio-wave methods in a row of perspective ones and to recommend their wide use in geophysics.

L5 ANSWER 46 OF 75 CA COPYRIGHT 2004 ACS on STN

AN 119:17520 CA

TI **Coherent**, submillimeter-wave emission from Bloch oscillations in a semiconductor superlattice

AU Waschke, Christian; Roskos, Hartmut G.; Schwedler, Ralf; Leo, Karl; Kurz, Heinrich

CS Inst. Halbleitertechn. II, Rheinisch-Westfael. Tech. Hochsch., Aachen, 5100, Germany

SO Physical Review Letters (1993), 70(21), 3319-22

AB The authors directly **detect** the **coherent electromagnetic** radiation originating from Bloch oscillations of charge carriers in an elec. biased semiconductor superlattice structure. The oscillation frequency can be tuned with the applied bias field from 0.5 THz to more than 2 THz, the detection limit of our measurement system.

L5 ANSWER 48 OF 75 CA COPYRIGHT 2004 ACS on STN

AN 116:195364 CA

TI Broadband microwave dielectric properties of polymers

AU Robertson, W. M.; Pastol, Y.; Arjavalingam, G.; Halbout, J. M.; Kopcsay, G. V.

CS Thomas J. Watson Res. Cent., IBM, Yorktown Heights, NY, 10598, USA

SO Materials Research Society Symposium Proceedings (1991), 214(Opt. Electr. Prop. Polym.), 87-93

AB **Coherent** microwave transient spectroscopy can be used to det. the complex dielec. properties of materials over a broad frequency range; the technique is based on radiation and **detection** of picosecond-duration **electromagnetic** transients by optoelectronically pulsed antennas. The technique is illustrated for a polyimide and a polyamide and doped polyacetylene.

L5 ANSWER 53 OF 75 CA COPYRIGHT 2004 ACS on STN

AN 108:65601 CA

TI A theory of multiwave devices on **coherent** magnetic bremsstrahlung of relativistic electron beams

AU Cherepenin, V. A.; Korzhenevskii, A. V.

CS Inst. Radioeng. Electron., Moscow, 103907, USSR

SO International Journal of Infrared and Millimeter Waves (1987), 8(11), 1411-23

AB Results are given of numerical simulation of **coherent** microwave radiation sources, based on magnetic bremsstrahlung of the relativistic e beam. For the description of **electromagnetic** field, the Fourier **anal.** of delayed potentials was used. Angular characteristics of collective radiation were studied. The possibility of high efficiency of multiwave interaction is demonstrated.

L5 ANSWER 64 OF 75 CA COPYRIGHT 2004 ACS on STN

AN 92:148025 CA

TI Electromagnetic interactions with advanced composite materials
AU Casey, K. F.
CS Dep. Electr. Eng., Kansas State Univ., Manhattan, KS, USA
SO Report (1979), AFOSR-TR-79-0893; Order No. AD-A071924, 17 pp. Avail.: NTIS From: Gov.
Rep. Announce. Index (U. S.) 1979, 79(24), 159
AB The interactions of plane electromagnetic waves with planar sheets, circular
cylindrical shells, and spherical shells of advanced composite materials, the effects of
transient current injection to a planar sheet of advanced composite material, and the
effects of **anisotropy** of composite laminates on their electromagnetic characterization and
interactions are described. The frequency over which **electromagnetic** characterizations and
interaction **analyses** are valid is that characteristic of the nuclear electromagnetic pulse.

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